

## COMMUTE ATLANTA SEPTEMBER 5, 2003

### Overview:

The Georgia Institute of Technology, School of Civil and Environmental Engineering is currently conducting the Commute Atlanta Study. Sponsored by the Federal Highway Administration, Georgia Department of Transportation, and Georgia Tech, this study is collecting travel data to provide better information on where, when, and under what conditions people drive in Atlanta. The Commute Atlanta study will help us to understand how we can make the transportation system safer and more efficient, and will enable planners and engineers to better plan the future of our regional transportation system.

More than 275 representative Atlanta households have been recruited to participate in this study. These volunteer households have allowed the research team to professionally install a GT Trip Data Collector in their vehicles. In total, 500 instrumented vehicles will be included in the study. Researchers remotely monitor the travel patterns of these vehicles, uploading vehicle and engine operating data via a cell phone data connection.



Households were selected for participation through a random-stratified sampling process. The research team first established income, household size, and vehicle ownership groupings that reflect the distribution of households in the Atlanta region. For example, a specific number of single-person, middle-income, single-automobile households are targeted for inclusion in the study. NuStats, a nationally-recognized travel survey consulting firm, worked with Georgia Tech to conduct the household recruitment.

The recruitment process begins with random digit telephone dialing to randomly select potential households. The recruiters explain the study and conduct a preliminary household interview to identify the geographic and demographic characteristics of these households. If the household falls into a sample group in which the target number of households has not yet been reached, they are invited to participate in the study. If the target number of households has already been reached, the recruitment firm thanks them for helping and moves on to a new telephone number.

Researchers were pleasantly surprised by the number of households that have agreed to participate in the study, even when instrumentation had to be installed in their vehicles. Many participants have stated that they believe that such studies are very important and that they are glad that they can provide information that will help transportation planners make improvements to our congested system.

Instrumented vehicle data are supplemented with travel diary survey data to better understand the types of trips made by these households (work, shopping, recreation, etc.). Each household maintains a two-day diary of their travel, recording the times and places visited and the activities undertaken. Travel diary data are retrieved through a computer-assisted telephone interview. General travel data, such as number of trips per household per day and selected travel routes, are

used to evaluate transportation demand models currently used in Atlanta's transportation planning process.



The instrumented vehicle data provide planners with much needed information on the operational characteristics of our freeways and major arterials. Vehicle position and speed data are used to identify locations of recurrent traffic congestion. Nationwide congestion surveys typically rank Atlanta in the top 10 cities, with around 70 hours/person/year lost in congestion. The ongoing effort in Atlanta can help to prioritize system improvements to obtain the biggest congestion reductions, at the least cost, and as quickly as possible.

The onboard instrumentation and data transmission protocols employed in the Commute Atlanta were developed by a partnership between Georgia Tech, Altius Solutions, and Cingular Wireless. The instrumentation and software were designed to Georgia Tech specifications and provide a very robust data collection solution. The onboard equipment tracks second-by-second vehicle position, speed, acceleration, and up to ten engine and emissions-related parameters. Six additional data lines can allow researchers to collect information from on-off sensors (e.g. seat-belt use or windshield wiper status) and could be used to turn on or off additional onboard devices. Data are transmitted via a cellular connection, which opens the doors to a wide array of supplemental services. A communications port enables the onboard equipment to send and receive data to and from almost any additional computing or scientific device carried onboard the vehicle. To date, the researchers have demonstrated this capability by collecting and integrating data from a SEMTECH-D (by Sensors, Inc.) onboard emissions measurement system and have connected the equipment to monitor the engine computers on a MARTA bus. The researchers are developing a number of additional services likely to reach the commercial market this year.

The onboard instruments provide very high resolution travel data. The data are so accurate that if a participant's vehicle were stolen, the research could locate the vehicle using the equipment. Data can be transmitted in real time for use in a variety of intelligent transportation system (ITS) efforts. With enough instrumented vehicles on the roadway, travel time and route guidance information could be provided to participating vehicles through an in-vehicle interface. The units send and receive text e-mail messages and transmit large blocks of data via the cell phone connection. Applying this technology in a variety of other ITS research activities would be relatively easy.

Given the level of detail in the data collection effort, privacy concerns needed to be directly addressed. All data collected in this study remain strictly confidential. A Certificate of Confidentiality was issued by the National Institutes of Health for this study. This certificate ensures that researchers cannot disclose any data that would identify project participants.

The Commute Atlanta study is the largest instrumented vehicle travel behavior study ever conducted. Parallel data from instrumented vehicles, household travel diaries, surveys of regional employers, and detailed information on transportation costs and system performance provide the most detailed data set ever compiled for use in examining travel behavior. The first year of the study alone will collect detailed information on more than one million trips and will

yield approximately 2 million vehicle-seconds of vehicle activity data every day. The data will provide a wealth of information for possible use in congestion mitigation, travel demand modeling, traffic simulation, signal timing improvement, roadway and vehicle safety analysis, roadway design improvement, economic analysis, intelligent transportation system strategy evaluation, transit performance assessment, parking policy analysis, and even air quality impact assessment.

### **Commuter Choice and Value Pricing Insurance Initiative:**

The Commute Atlanta project is the first in a three-phase effort sponsored by the Federal Highway Administration and the Georgia Department of Transportation. Although the one-year Commute Atlanta project is designed to provide critical transportation planning data for the Atlanta region, it also was designed to serve as the starting point for implementation of a research effort to evaluate the potential effects of cent-per-mile automobile insurance pricing. Under the full 3-year program contract with the U.S. Department of Transportation, the Commute Atlanta project established baseline travel patterns for all of the participating households. After Commute Atlanta was completed, the participating households would have been invited to participate in a pay-as-you-drive insurance research study.

In the second phase of the study, current insurance rates for the 275 household study participants would have been used to calculate their current cent-per-mile equivalent insurance cost. Any household that reduced their household miles of travel in the second year would have received insurance rebates in accordance with their mileage-based rate schedule. Households that drove more in the second year would not have been affected. The research team would have monitored the changes in driving patterns and undertaken statistical analyses of household characteristics, vehicle travel, and relevant employer survey data (parking costs, transit accessibility, etc.) to examine the relationships between the incentives offered and subsequent travel behavior changes. The third phase of research would have examined the potential benefits of further increasing the efficiency of insurance pricing by more accurately linking premiums to onroad driving risk. Driving during the safest hours, on the safest roads, under the safest conditions, would be rewarded and driver response to the incentives was to be monitored and assessed. The Atlanta insurance pricing research efforts are designed to shed light on many of the implementation uncertainties that are currently keeping insurance on the sidelines with respect to insurance pricing by the mile.

Although originally designed as a three phase research study to examine the effect of cent-per-mile insurance pricing, the U.S. Department of Transportation has chosen not to support the second and third phases due to funding issues. Despite the loss of funding for the ongoing research effort on insurance pricing, the phase one research effort will still yield the best comprehensive set of travel data ever collected and the research team remains very excited about future research prospects.

For more information about the Commute Atlanta and the Commuter Choice and Value Pricing Insurance Initiative:

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